

T03D03 – (3.2) Physical Properties

Name _____

1. 3.2.1 Define the terms first ionization energy and electronegativity. (1)
 - a. Explain, and illustrate, the first ionization energy and its units:
 - b. Define the second ionization energy. Which group would have a very large 2nd I.E.?
 - c. Define electronegativity:
 - i. What is the scale and unit for electronegativity?

2. 3.2.2 Describe and explain the trends in atomic radii, ionic radii, first ionization energies, electronegativities and melting points for the alkali metals (Li → Cs) and the halogens (F →). (3)
 - a. Define atomic radius for each of the following:

Type of Bonding	Illustration:	Definition of Measurement
Metallic Radius		
Covalent Radius		
Van der Waals Radius		

- b. Atomic Radii:
 - i. The atomic radius is determined by two OPPOSING forces
 1. Describe the Shielding Effect:
 2. Describe the Nuclear Charge:
 - ii. When going down a group, explain why the atomic radius increases
- c. Ionic Radii:
 - i. Illustrate and explain the radii of ionic species:
- d. Ionization Energy:
 - i. Explain why the trend in ionization energy down a group decreases:

- e. Electronegativity:
 - i. Explain why the trend in electronegativity down a group decreases:

 - ii. Explain why the trend in electronegativity across a period increases:

 - f. Melting Point:
 - i. Explain why the M.P. decreases down the Alkali Metals:

 - ii. Explain why the M.P. increases down the Halogens:
3. 3.2.3 Describe and explain the trends in atomic radii, ionic radii, first ionization energies and electronegativities for elements across period 3. (3)
- a. Atomic Radii:
 - i. Explain why the trend in atomic radii across period 3 decreases:

 - b. Ionic Radii:
 - i. Illustrate and explain the trend in ionic radii across period 3:

 - ii. What is an isoelectronic Species?

 - iii. Explain the trend in ionic radii across period 3:

 - c. Ionization Energy:
 - i. Explain why there is an increase in ionization energy across period 3:
4. 3.2.4 Compare the relative electronegativity values of two or more elements based on their positions in the periodic table. (3)
- a. Once again, what's the trend for electronegativity in the periodic table?

 - b. What does a comparison of electronegativities between elements help to determine? Explain: